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ANNCR: THE VOICE OF AMERICA PRESENTS: :...SCIENCE NOTEBOOK... A SUMMARY OF EVENTS IN SCIENCE, MEDICINE AND TECHNOLOGY. EACH WEEK AT THIS TIME, WE BRING YOU REPORTS ON DEVELOPMENTS THAT MAY AFFECT OUR DAILY LIVES. WITH THE FIRST STORY, HERE IS YOUR SCIENCE EDITOR -----.

(WORLDWIDE ENERGY CHANGES -- 3-2683 --DOSA)

EDITOR: THE WORLDWIDE SHORTAGE OF ENERGY IS GOING TO PRODUCE SEVERE ECONOMIC DISLOCATIONS AND BRING A HALT TO THE EXPLOSIVE GROWTH THAT CIVILIZATION HAS ENJOYED FOR THE LAST HUNDRED YEARS. THAT PREDICTION COMES FROM THE PRESIDENT OF THE CARNEGIE INSTITUTION OF WASHINGTON. HERE IS ----- WITH DETAILS.

VOICE: THE PRESTIGIOUS CARNEGIE INSTITUTION IS A PRIVATE EDUCATIONAL ORGANIZATION THAT SUPPORTS RESEARCH IN THE PHYSICAL AND BIOLOGICAL SCIENCES. ITS PRESIDENT, DOCTOR PHILIP ABELSON, A PROMINENT NUCLEAR PHYSICIST, SAYS IN HIS ANNUAL REPORT THAT "MANY PEOPLE OF THE WORLD ARE BEGINNING TO LEARN THE HARD WAY WHAT A FEW OBSERVERS HAVE KNOWN FOR A LONG TIME, THAT EXPONENTIAL GROWTH OF ANY KIND CANNOT GO ON INDEFINITELY."

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DOCTOR ABELSON THEN POINTS OUT THAT FOR MORE THAN TWO DECADES, UNTIL THE END OF 1973, THE USE OF PETROLEUM IN THE UNITED STATES, WESTERN EUROPE AND JAPAN INCREASED RAPIDLY, WITH PETROLEUM BECOMING THE PRINCIPAL SOURCE OF ENERGY. THE OIL EMBARGO OF 1973 AND THE SUBSEQUENT SHARP INCREASE IN OIL PRICES HAVE PUT A SUDDEN END TO THIS RAPID GROWTH AND THE WORLD IS NOW FORCED TO LOOK FOR ALTERNATE SOURCES OF ENERGY.

THE UNITED STATES, ACCORDING TO DOCTOR ABELSON, IS FORTUNATE IN THAT IT HAS MANY ALTERNATIVES, INCLUDING A CONSIDERABLE GEOTHERMAL ENERGY POTENTIAL, GREAT COMPETENCE IN NUCLEAR ENERGY, TREMENDOUS RESOURCES OF FORESTS AND FARMS, AND ABUNDANT USABLE SOLAR ENERGY. FOR MANY OTHER COUNTRIES, THE CHOICES ARE MORE LIMITED. FRANCE, FOR EXAMPLE, MUST EXPAND ITS NUCLEAR POWER PRODUCING FACILITIES IF IT WANTS TO MAINTAIN THE STANDARD OF LIVING ACHIEVED THROUGH DEPENDENCE ON IMPORTED OIL.

A SIMILAR SITUATION PREVAILS IN SOUTH AMERICA, WHICH HAS VERY LITTLE COAL. MUCH OF THAT CONTINENT, SAYS DOCTOR ABELSON, MIGHT USE ENERGY DERIVED FROM PLANTS AND TREES. BUT IN PRACTICE, SOUTH AMERICA IS LIKELY "TO FOLLOW THE EXAMPLE OF BRAZIL, WHICH IS GOING NUCLEAR IN A BIG WAY." LIKEWISE, IRAN, CURRENTLY A MAJOR EXPORTER OF OIL, IS PAYING MORE AND MORE ATTENTION TO THE DEVELOPMENT OF NUCLEAR ENERGY IN ANTICIPATION OF THE DAY WHEN ITS OIL WELLS WILL BE DEPLETED.

VOICE:
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THE PRESIDENT OF THE CARNEGIE INSTITUTION IS APPREHENSIVE ABOUT THE GLOBAL SPREAD OF NUCLEAR POWER, UNLESS ADEQUATE SAFEGUARDS ARE PROVIDED TO ASSURE THE SAFETY OF NUCLEAR OPERATIONS, BOTH AGAINST ACCIDENTS AND THE THEFT OF NUCLEAR MATERIALS BY TERRORISTS. HE SUGGESTS INSTEAD MAKING A BETTER USE OF THE ENERGY OF THE SUN WHICH COULD BE HARVESTED IN A VARIETY OF WAYS, INCLUDING THE LARGE-SCALE GROWING OF TREES WHICH PROVIDE AN EXCELLENT RENEWABLE SOURCE OF ENERGY.

(OFFSHORE NUCLEAR POWER -- 3- 2683 -- PHUONG/VIET.SVC)

EDITOR: OFFSHORE OIL WELLS MAY BE JOINED BY OFFSHORE NUCLEAR POWER PLANTS AS A SOURCE OF ENERGY. VOA'S DUC PHUONG HAS THIS REPORT ON THE PLANNED CONSTRUCTION OF THE WORLD'S FIRST FLOATING NUCLEAR POWER PLANT.

VOICE: ONE-QUARTER CENTURY FROM NOW, BY THE YEAR 2000, NUCLEAR ENERGY MAY SUPPLY HALF OF THE ELECTRIC POWER NEEDS OF THE UNITED STATES. BUT FINDING A PLACE TO BUILD NUCLEAR POWER PLANTS IS BECOMING INCREASINGLY DIFFICULT. ONE REASON IS THAT IN THE UNITED STATES, NEARLY HALF OF THE TOTAL ENERGY DEMAND COMES FROM AREAS WITHIN THREE-HUNDRED KILOMETERS OF THE ATLANTIC, GULF AND PACIFIC COASTS, WHERE POTENTIAL LAND SITES FOR POWER PLANTS ARE GETTING MORE AND MORE SCARCE.

VOICE:
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THE FIRST FLOATING POWER PLANT, TO BE ANCHORED OFF THE NEW JERSEY COAST IN THE ATLANTIC OCEAN, WOULD REQUIRE AN AREA OF ABOUT TWO-HUNDRED HECTARES IF IT WERE BUILT ON LAND. PLANS CALL FOR ASSEMBLING THE PLANT IN A SHIPYARD AND TOWING IT TO ITS INTENDED LOCATION WHERE IT WOULD BE ANCHORED TO THE OCEAN FLOOR. THE OCEAN ITSELF WOULD FURNISH ALL THE WATER NEEDED TO COOL THE POWER GENERATING EQUIPMENT.

THE PROPOSED FLOATING NUCLEAR POWER PLANT WOULD HAVE TO MEET THE MOST STRINGENT SAFETY REQUIREMENTS. IT WOULD HAVE TO BE ABLE TO WITHSTAND WAVES NEARLY FIFTEEN METERS HIGH AND WINDS BLOWING AT A SPEED OF TWO-HUNDRED-FIFTY KILOMETERS AN HOUR. ALSO, THE PLANT MUST BE STURDY ENOUGH TO REMAIN INTACT EVEN AFTER A COLLISION WITH THE LARGEST SHIPS NOW AFLOAT.

THE DESIGNERS OF THE PROPOSED FLOATING NUCLEAR POWER PLANT HOPE IT CAN BECOME OPERATIONAL BY THE MIDDLE OF THE NEXT DECADE SO THAT IT CAN START FURNISHING THE POWER NEEDS OF A CONSIDERABLE PORTION OF THE EASTERN UNITED STATES.

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(WOMEN LIVE LONGER -- 3- 2683 -- DOSA)

EDITOR: U.S. CENSUS BUREAU STATISTICIANS HAVE CONFIRMED WHAT MEN HAVE SUSPECTED ALL ALONG, NAMELY THAT WOMEN LIVE LONGER.
----- HAS THIS EXPLANATION:

VOICE: THE STATISTICS SHOW THAT WOMEN ARE CLEARLY GAINING ON MEN. AT THE TURN OF THE CENTURY, WOMEN LIVED TWO-TO-THREE YEARS LONGER THAN MEN. IN THE YEARS SINCE THEN, THE LIFE SPAN OF BOTH SEXES HAS INCREASED BUT SO HAS THE GAP BETWEEN THE LIFE EXPECTANCY OF MEN AND WOMEN. TODAY, THE AVERAGE AMERICAN WOMAN LIVES SEVENTY-FIVE YEARS AND FOUR MONTHS, WHILE THE AVERAGE MAN HAS A LIFE SPAN OF ONLY LITTLE MORE THAN SIXTY-SEVEN-AND-A-HALF YEARS.

WASHINGTON POST MEDICAL REPORTER STUART AUERBACH QUOTES SCIENTISTS WHO BELIEVE THIS INCREASING GAP IS DUE TO GENETIC CONSIDERATIONS AND NOT THE GREATER STRESSES THAT MEN MUST CONTEND WITH, AS PREVIOUSLY THOUGHT. THIS NEW BELIEF HAS BEEN BORNE OUT BY STUDIES CONDUCTED AMONG ROMAN CATHOLIC MONKS AND NUNS. EVEN THOUGH BOTH THE NUNS AND THE MONKS LIVE SHELTERED, PRESUMABLY STRESS-FREE LIVES, IT WAS FOUND THAT NUNS LIVE LONGER THAN THE MONKS.

ANOTHER FINDING HAS BEEN THAT WOMEN PAST CHILD-BEARING AGE HAVE LESS OF A BLOOD CLOTTING PROBLEM THAN MEN DO. THIS PROBABLY ACCOUNTS FOR THE FEWER HEART ATTACKS AMONG MIDDLE AGED AND OLDER WOMEN THAN MEN. SCIENTISTS THINK NATURE HAS PROVIDED YOUNG WOMEN WITH A GREATER BLOOD CLOTTING ABILITY TO KEEP THEM FROM BLEEDING TO DEATH DURING THEIR MENSTRUAL PERIODS.

ANIMAL STUDIES PERFORMED AT WASHINGTON'S GEORGETOWN UNIVERSITY CONFIRM THAT FEMALE RATS AND GUINEA PIGS

VOICE: ALSO HAVE A LOWER BLOOD CLOTTING ABILITY THAN THE MALES
(CONT'D) OF THEIR SPECIES.

DOCTORS AND STATISTICIANS ALIKE AGREE THAT THE GAP BETWEEN THE LIFE EXPECTANCY OF MEN AND WOMEN IS NOT LIKELY TO NARROW IN THE FORESEEABLE FUTURE. ONE UNDESIRABLE FACTOR THAT MIGHT NARROW IT WOULD BE THE CURRENT INCREASE IN CIGARETTE SMOKING AMONG WOMEN. THE TAR AND NICOTINE THE WOMEN INHALE MAY WELL HELP INCREASE THEIR SHARE OF LUNG CANCER WHICH IS ALREADY ONE OF THE MAIN KILLERS OF MEN.

(RESEARCH YACHT CELEBRATED -- 3- 2683 -- DOSA)

EDITOR: MANY, MANY YEARS AGO, AN AMERICAN MILLIONAIRE HAD A BEAUTIFUL SIXTY-ONE METER YACHT BUILT IN A DANISH SHIPYARD. THE HUSSAR, AS THE LUXURIOUS YACHT WAS CALLED, WAS DRAFTED INTO MILITARY SERVICE DURING THE SECOND WORLD WAR AND EVENTUALLY BECAME A SCIENTIFIC RESEARCH VESSEL WHICH HAS JUST COMPLETED ONE-MILLION MILES (1.6 MILLION KILOMETERS) OF CARRYING SCIENTISTS ON THE WORLD'S OCEANS. HERE IS ----- WITH A LOOK AT SOME OF THE HIGHLIGHTS OF THOSE TRAVELS.

VOICE: THE HUSSAR HAS LONG AGO SHED ITS THREE MASTS AND SAILS, ALONG WITH ITS LUXURIOUS FURNISHING, EVEN ITS NAME. TODAY, THE SHIP IS CALLED VEMA, IS PROPELLED BY DIESEL ENGINES, AND ITS ONCE ELEGANT SALONS AND STATE ROOMS HAVE BEEN CONVERTED INTO LABORATORIES. VEMA WAS ACQUIRED AFTER THE SECOND WORLD WAR BY THE LATE DOCTOR MAURICE

VOICE:
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EWING, DIRECTOR OF NEW YORK'S COLUMBIA UNIVERSITY'S
LAMONT-DOHERTY GEOLOGICAL OBSERVATORY.

DOCTOR EWING AND HIS FELLOW SCIENTISTS HAVE BEEN SAILING
ABOARD THE VEMA ON ALL THE WORLD'S OCEANS, TAKING
MEASUREMENTS, SAMPLING SEAFLOOR SEDIMENTS, OBSERVING
CHANGES IN THE OCEANS' MAGNETIC FIELDS, COLLECTING
IMMENSE AMOUNTS OF DATA WHICH HAVE RESULTED IN DISCOVERIES
GIVING US AN ENTIRELY NEW UNDERSTANDING OF THE STRUCTURE
OF THE EARTH.

PERHAPS THE MOST IMPORTANT CONTRIBUTION OF THE VEMA HAS
BEEN THE FINDING OF EVIDENCE IN SUPPORT OF THE
CONTINENTAL DRIFT THEORY, REGARDED BY MANY AS ONE OF
THE MAJOR SCIENTIFIC DISCOVERIES OF OUR CENTURY.
MEASUREMENTS OF CHANGES IN THE MAGNETISM ON THE FLOOR OF
THE ATLANTIC OCEAN HAVE FURNISHED PROOF THAT THE OCEAN
FLOOR IS SPREADING AND ITS BORDERING CONTINENTS ARE
DRIFTING APART.

THE DAY OF COMPLETION OF THE FIRST MILLION MILES WAS ONE
OF WORK AS USUAL FOR THE VEMA AND ITS SCIENTIFIC CREW.
THE SHIP WAS SOMEWHERE SOUTH OF AUSTRALIA, STUDYING, AS
USUAL, THE OCEAN FLOOR, CONTINUING WHAT HAS BEEN HAILED
AS "SCIENCE'S LONGEST AND MOST PRODUCTIVE EXPLORATION
OF THE OCEANS."

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(ELECTRIFIED CHICKEN -- 3-2683 -- DOSA)

EDITOR: CHICKENS AND ELECTRICITY ARE SELDOM THOUGHT OF TOGETHER, UNLESS IT IS THE IDEA OF BAKING A CHICKEN IN AN ELECTRIC OVEN. BUT THERE IS ANOTHER CONNECTION, TOO, AS ----- REPORTS.

VOICE: THE CONNECTION CAME TO LIGHT AT A SCIENTIFIC MEETING WITH THE UNLIKELY NAME OF FIRST INTERNATIONAL SYMPOSIUM ON ENVIRONMENTAL CONCERNS IN RIGHTS-OF-WAY MANAGEMENT, HELD AT MISSISSIPPI STATE UNIVERSITY. THE SYMPOSIUM WAS DEALING WITH THE ENVIRONMENTAL EFFECTS OF HIGH-VOLTAGE ELECTRIC POWER LINES ON THEIR "RIGHT-OF-WAY," THAT IS, THE GROUND UNDERNEATH THE WIRES WHICH CARRY AS MUCH AS THREE-QUARTER-MILLION VOLTS OF ELECTRICITY.

DOCTOR H.B. GRAVES, AN ASSOCIATE PROFESSOR OF POULTRY SCIENCE AT PENNSYLVANIA STATE UNIVERSITY, REPORTED ON HIS FINDING THAT STRONG ELECTRIC FIELDS TEND TO ACCELERATE THE GROWTH OF MALE CHICKENS FOR A FEW WEEKS AFTER BIRTH. PROFESSOR GRAVES FOUND THAT CHICKENS EXPOSED TO HIGH ELECTRIC FIELDS FOR FOUR DAYS EXHIBITED SOMEWHAT REDUCED ACTIVITY AND A TEN PERCENT INCREASE IN THEIR WEIGHT. BUT THIS INCREASE WAS SEEN ONLY IN MALES. FEMALE CHICKENS REMAINED UNAFFECTED BY THE ELECTRICITY.

OTHER THAN THE INCREASED GROWTH OF MALE CHICKENS, THE PENNSYLVANIA SCIENTIST FOUND NO OTHER EVIDENCE OF THE EXPOSURE TO HIGH-VOLTAGE ELECTRIC FIELDS MAKING ANY

VOICE:
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DIFFERENCE. HE THINKS, HE SAID, "THAT THE FORCE FIELD EITHER OPERATES BY STIMULATING THE MALE NEUROENDOCRINE SYSTEM AND THAT THE ENHANCED GROWTH RESPONSE IS A RESULT OF THAT STIMULATION, OR THAT REDUCED ACTIVITY OF THE EXPOSED CHICKENS SHUNTS ENERGY INTO GROWTH RATHER THAN BODY MAINTENANCE."

INCIDENTALLY, CHICKEN GROWERS NEED NOT WASTE EXPENSIVE ELECTRICITY. DOCTOR GRAVES HAS ALSO FOUND THAT AFTER ABOUT FIVE WEEKS, THE FEMALES AND THE NON-EXPOSED MALES HAVE CAUGHT UP IN THE GROWTH THE ELECTRIFIED CHICKENS.

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RC/CAK